WHAT IS CLAIMED IS:

1. A process for synthesis of a Fischer-Tropsch product, the product comprising a syncrude or a chemical, the process comprising:

providing self-supported precipitated α-Fe_2O_3-based Fischer-Tropsch catalyst particles, wherein the self-supported precipitated α-Fe_2O_3-based Fischer-Tropsch catalyst particles are produced by heat treating precipitated α-Fe_2O_3-based particles at a temperature of from 320°C to 500°C; and

contacting a synthesis gas with the self-supported precipitated α-Fe_2O_3-based Fischer-Tropsch catalyst particles in a Fischer-Tropsch slurry-bed reactor, whereby a Fischer-Tropsch product comprising a syncrude or a chemical is obtained.

2. The process of claim 1, wherein heat treating precipitated α-Fe_2O_3-based particles is carried out at a temperature of from 360°C to 500°C.

3. The process of claim 1, wherein heat treating precipitated α-Fe_2O_3-based particles is carried out at a temperature of from 360°C to 390°C.

4. The process of claim 1, wherein heat treating precipitated α-Fe_2O_3-based particles of the said catalyst particles is carried out at a temperature of 380 °C.

5. The process of claim 1, wherein heat treating precipitated α-Fe_2O_3-based particles is conducted for at least 0.1 hours.

6. The process of claim 1, wherein heat treating precipitated α-Fe_2O_3-based particles is conducted for from 0.5 hours to 4 hours.

7. The process of claim 1, wherein the self-supported precipitated α-Fe_2O_3-based Fischer-Tropsch catalyst particles have an average observed Fischer-Tropsch activity in excess of 1.2 under low temperature Fischer-Tropsch operating conditions.

8. A process for synthesis of a Fischer-Tropsch product, the product comprising a syncrude or a chemical, the process comprising:

providing self-supported precipitated α-Fe_2O_3-based Fischer-Tropsch catalyst particles, wherein the self-supported precipitated α-Fe_2O_3-based Fischer-Tropsch catalyst particles are produced by heat treating precipitated α-Fe_2O_3-based particles at a temperature of from 320°C to 500°C, whereby breakage resistance of the catalyst particles is increased; and contacting a synthesis gas with the self-supported precipitated α-Fe_2O_3-based Fischer-Tropsch catalyst particles in a Fischer-Tropsch slurry-bed reactor, whereby a Fischer-Tropsch product comprising a syncrude or a chemical is obtained, wherein the increased breakage resistance of the catalyst particles inhibits formation of catalyst fines in the Fischer-Tropsch slurry-bed reactor, such that performance of a solid separation system employed in the process is maintained.

9. The process of claim 8, wherein heat treating precipitated α-Fe_2O_3-based particles is carried out at a temperature of from 360°C to 500°C.

10. The process of claim 8, wherein heat treating precipitated α-Fe_2O_3-based particles is carried out at a temperature of from 360°C to 390°C.

11. The process of claim 8, wherein heat treating precipitated α-Fe_2O_3-based particles of the said catalyst particles is carried out at a temperature of 380 °C.

12. The process of claim 8, wherein heat treating precipitated α-Fe_2O_3-based particles is conducted for at least 0.1 hours.

13. The process of claim 8, wherein heat treating precipitated α-Fe_2O_3-based particles is conducted for from 0.5 hours to 4 hours.

14. The process of claim 8, wherein the self-supported precipitated α-Fe_2O_3-based Fischer-Tropsch catalyst particles have an average observed Fischer-Tropsch activity in excess of 1.2 under low temperature Fischer-Tropsch operating conditions.

15. The process of claim 8, wherein the self-supported precipitated α-Fe_2O_3-based Fischer-Tropsch catalyst particles have an average observed Fischer-Tropsch activity in excess of 1.2 for at least 48 hours under low temperature Fischer-Tropsch operating conditions.